UTAH OIL AND GAS CONSERVATION COMMISSION

REMARKS: WELL LOG _____ ELECTRIC LOGS _____ FILE X WATER SANDS _____ LOCATION INSPECTED GAS WELL SUB. REPORT/abd

DATE FILED 4-16-81

LAND: FEE & PATENTED X STATE LEASE NO. PUBLIC LEASE NO. INDIAN

DRILLING APPROVED: 5-15-81

SPUDDED IN:

COMPLETED: 10-14-81 LA PUT TO PRODUCING

INITIAL PRODUCTION:

GRAVITY A.P.I.

GOR:

PRODUCING ZONES:

TOTAL DEPTH:

WELL ELEVATION:

DATE ABANDONED: LOCATION ABANDONED 10-14-81

FIELD: Wildcat 3/86

UNIT:

COUNTY: Rich

WELL NO. DESERT SKULL #1-17B API NO. 43-033-30032

LOCATION Surface: 533 FT. FROM (N) (S) LINE, 755 FT. FROM (E) (W) LINE SE SE 1/4 — 1/4 SEC. 17

Bottom: 660 FSL 660 FEL

TWP.	RGE.	SEC.	OPERATOR	TWP.	RGE.	SEC.	OPERATOR
7N	8E	17	CHEVRON USA INC.				

Location abandoned 10-19-81

Form DOGC-1a

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. Type of Work
DRILL [XX] DEEPEN [ ] PLUG BACK [ ]

b. Type of Well
Oil Well [ ] Gas Well [XX] Other Single Zone [XX] Multiple Zone [ ]

2. Name of Operator
Chevron U.S.A. Inc.

3. Address of Operator
P. O. Box 599, Denver, CO 80201

4. Location of Well (Report location clearly and in accordance with any State requirements.*)
At surface
533' FSL & 755' FEL SE SE
At proposed prod. zone
660' FSL & 660' FEL

5. Lease Designation and Serial No.
Fee

6. If Indian, Allottee or Tribe Name

7. Unit Agreement Name

8. Farm or Lease Name
Chevron

9. Well No.
1-17B

10. Field and Pool, or Wildcat
Subthrust
Thomas Canyon-Cretaceous

11. Sec., T., R., M., or Blk. and Survey or Area
Sec. 17, T7N, R8E

14. Distance in miles and direction from nearest town or post office*
6-7 miles west and north of Evanston, Wyoming

12. County or Parrish
Rich

13. State
Utah

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg. line, if any)
533'

16. No. of acres in lease
6,140.62

17. No. of acres assigned to this well
640

18. Distance from proposed location* to nearest well, drilling, completed, or applied for, on this lease, ft.
No Other Well

19. Proposed depth
17,600

20. Rotary or cable tools
Rotary

21. Elevations (Show whether DF, RT, GR, etc.)
GR 6921

22. Approx. date work will start*
May 1982

23.
PROPOSED CASING AND CEMENTING PROGRAM

Size of Hole	Size of Casing	Weight per Foot	Setting Depth	Quantity of Cement
17-1/2"	13-3/8"	72#	2500	To Surface
12-1/4"	9-5/8"	53.5#	14,000-7,000	As Required
12-1/4"	9-5/8"	47#	7,000-Surf	As Required
8-1/2"	7"	38#	TD-16,000	As Required
8-1/2"	7"	35#	16,000-14,000	As Required
8-1/2"	7"	32#	14,000-Surf	As Required

It is proposed to drill this Development Well to a depth of 17,600' to test the Subthrust Cretaceous.

Attachment:
Certified Plat
Drilling Procedure
Chevron Class IV BOPE Requirements
H2S Contingency Plan (Will Submit Later)
Road Access Map
Completion Procedure to be submitted by Sundry Notice

3-State
2-USGS
1-Partner
1-GDE
1-ALF
1-MEC
1-File

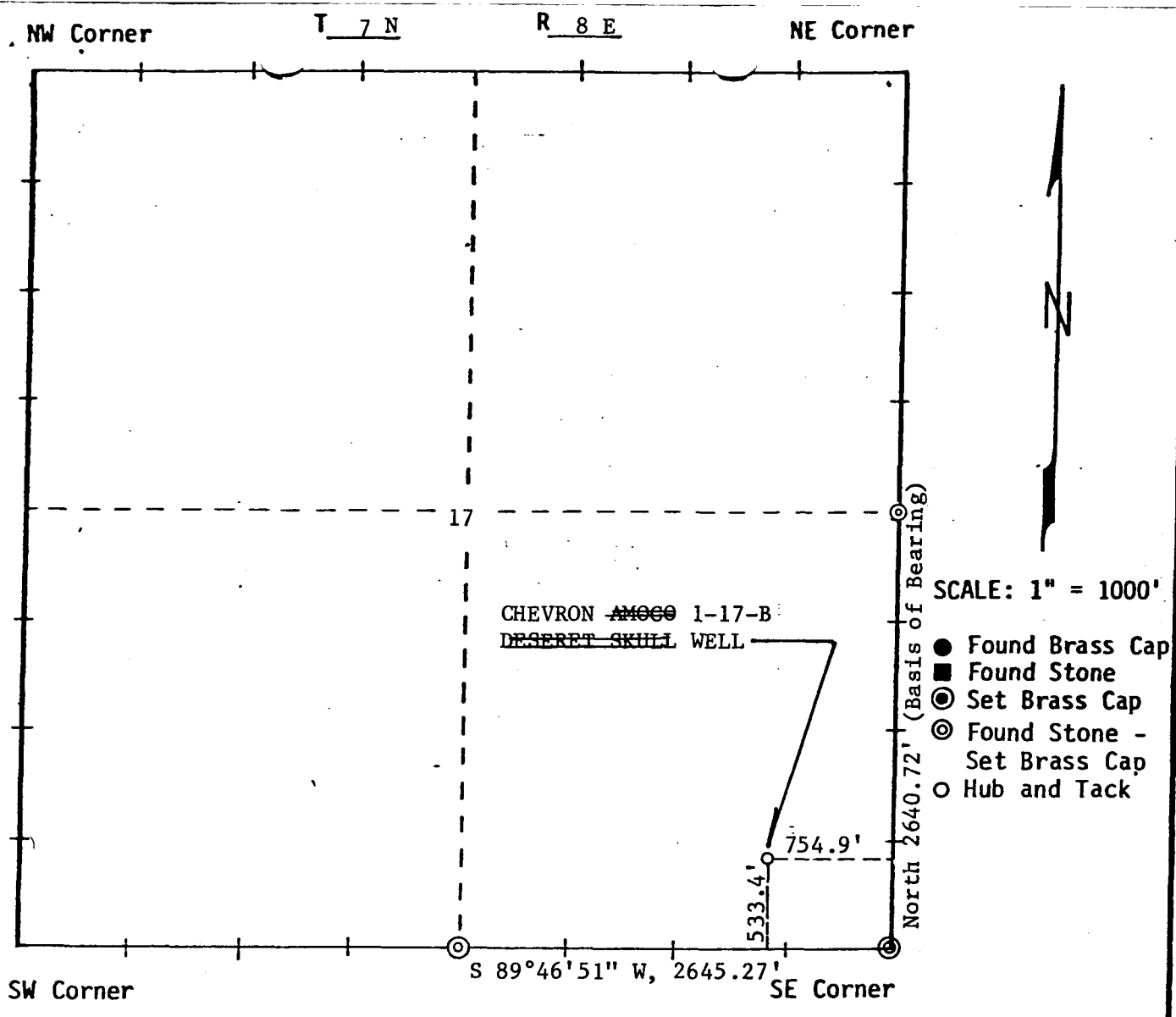
IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.
Signed [signature] Title Engineering Assistant Date April 13, 1981

(This space for Federal or State office use)

Permit No. Approval Date

Approved by Title Date
Conditions of approval, if any:



I, Loyal Doran Olson, III of Evanston, Wyoming certify that in accordance with a request from Bert Stieger of Denver, Colorado for Chevron USA I made a survey on the 10th day of April, 19 81 for Location and Elevation of the CHEVRON AMOCO 1-17-B ~~Deseret Skull~~ Well as shown on the above map, the wellsite is in the SE¼ SE¼ of Section 17, Township 7 North, Range 8 East of the Salt Lake Base & Meridian, Rich County, State of Utah, Elevation is 6921 Feet to the top of hub Datum Spot Elevation 7033' in NE¼ NE¼ Section 29, T7N, R8E, "Murphy Ridge Quadrangle," USGS quad map

Reference point	North 300'	Elev. to top of pin	6904.1'
Reference point	West 300'	Elev. to top of pin	6925.2'
Reference point	South 300'	Elev. to top of pin	6932.2'
Reference point	East 300'	Elev to top of pin	6912.7'

4-11-81

Loyal Doran Olson, III, Utah R.L.S. NO. 4954

DATE: April 11, 1981
JOB NO.: 81-5-1

UINTA ENGINEERING & SURVEYING, INC.
808 MAIN STREET, EVANSTON, WYOMING

DRILLING PROCEDURE

Field Thomas Canyon Well Chevron [redacted] 1-17B

Location C SESE Sec 17, T7N, R8E, Rich County, Utah

Drill X Deepen ____ Elevation: GL 6900 est KB 6930 est Total Depth 17,600

Non-Op Interests Amoco 59.8982%

1. Name of surface formation: Wasatch BHL: 660 FSL, 660 FEL

2. Estimated tops of important geologic markers:

Formation	Approximate Top	Formation	Approximate Top
Twin Creek	8030 (-1100)	Mission Canyon	15030 (-8100)
Thaynes	11430 (-4500)	Bighorn	17080 (-10150)
Phosphoria	13930 (-7000)	Thrust fault-Cretaceous	17430 (-10500)
		Total Depth	17600

3. Estimated depths of anticipated water, oil, gas or other mineral bearing formations:

Formation	Depth	Type	Formation	Depth	Type
Mission Canyon	15000	Sour gas-condensate			
Bighorn	17000	Sour gas-condensate			

4. Casing Program (O = old, N = new):

	Surface	O/N	* Intermediate	O/N	** Oil String/ Liner	O/N
Hole Size	17½"		12¼"		8½"	
Pipe Size	13 3/8"	N	9 5/8"	N	7"	N
Grade	S80 or S95		SS-95		SS-95	
Weight	72#		47# & 53.5#		32#, 35# & 38#	
Depth	2500'		14,000'		TD	
Cement	To surface		As required		As required	
Time WOC	12 hrs.		24 hrs.		24 hrs.	
Casing Test	3000 psi		5000 psi		5000 psi	
BOP						

Remarks *9 5/8" 47# surface to 7000' & 9 5/8" 53.5# 7000' to 14,000'
**7" 32# surface to 14,000' & 7" 35# 14,000' to 16,000' & 7" 38# 16,000' to TD (17,600')

5. BOPE: Chevron Class IV 5000 psi & 10,000 psi MSP with H_2S trim to be tested at full working pressure or 70% of casing yield.

6. Mud Program:

Depth Interval	Type	Weight	Viscosity	Water Loss
0-2,500	GEL-WTR.	± 8.8 ppg	35-40 sec.	-
2,500-14,000	SAT.-SALT	±10.0 ppg	35-40 sec.	10-15 cc
14,000-TD	GEL-CHEM	±11.0 ppg	40-45 sec.	8-10 cc

7. Auxiliary Equipment: Drill pipe safety valve, PVT, Kelly cocks, mud cleaner, degasser, automatic choke and H_2S safety equipment.

8. Logging Program:

Surface Depth	
Intermediate Depth	GR-DLL-MSFL; GR-CNL-FDC-CAL; GR-Sonic (Integ); HDT
Oil String Depth	" " " "
Total Depth	" " " "

9. Mud Logging Unit: Conventional 2-man 2,500 to TD. H_2S detector 13,500 to TD
Scales: 2" = 100' ____ to ____; 5" = 100' 2500 to TD

10. Coring & Testing Program:

		Formations	Approximate Depth	Approximate Length of Core
Core 9*	DST			9@ 60-540'
Core	DST			

11. Anticipated Bottom Hole Pressure/Temperatures/Hazards and plans for mitigating:
Sour gas potential 13,500 to TD. BHT est 250°F. BHP est 8400 psi. Salt in interval 7400' to 8000'

12. Completion & Remarks: Completion to be based on results of core analysis and wireline log evaluation

Division Development Geologist [signature] 4/12/82 Division Drilling Superintendent [signature] 4-13-82
Chief Development Geologist ____ Date ____

WS-44

* 6 Mission Canyon @15,000; 1 Darby @ 16,800; 2 Bighorn @17,100

6. Mud Program

(a) Caustic shall be used to control a PH of 10.0-11.0 in a water base mud system to control corrosion.

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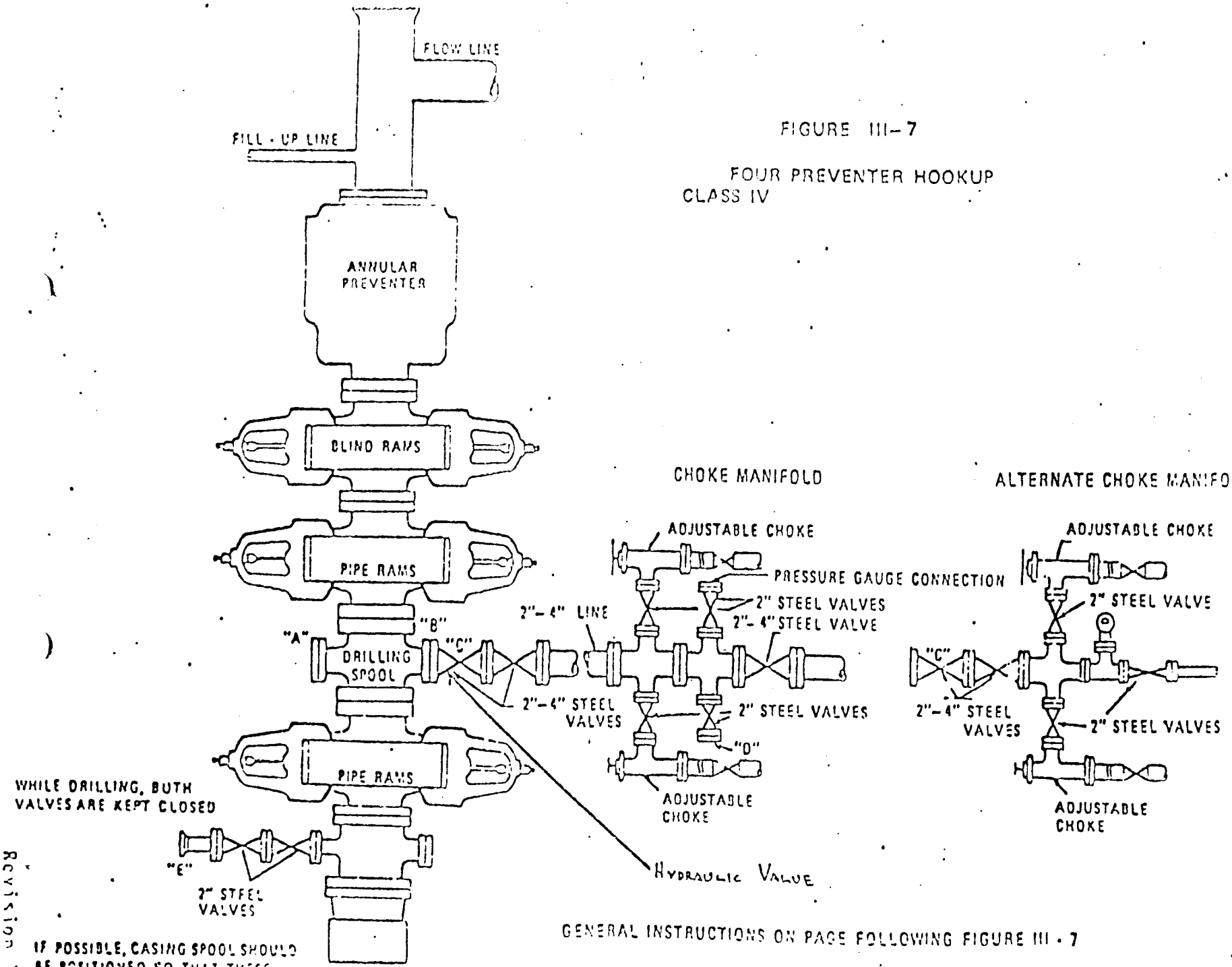
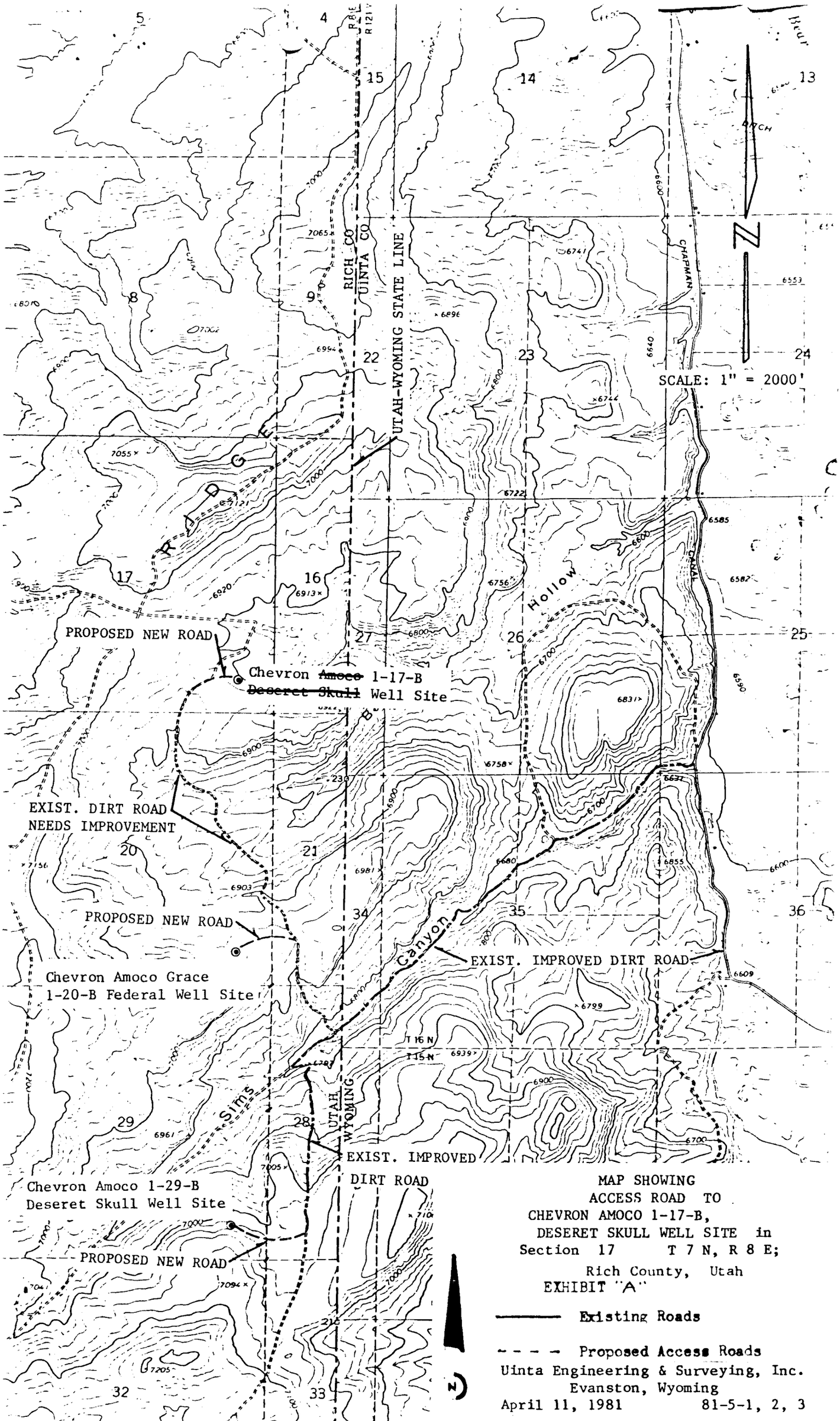
FIGURE III-7

FOUR PREVENTER HOOKUP
CLASS IV



GENERAL INSTRUCTIONS ON PAGE FOLLOWING FIGURE III - 7



MAP SHOWING
ACCESS ROAD TO
CHEVRON AMOCO 1-17-B,
DESERET SKULL WELL SITE in
Section 17 T 7 N, R 8 E;
Rich County, Utah
EXHIBIT "A"

——— Existing Roads

- - - - Proposed Access Roads

Uinta Engineering & Surveying, Inc.
Evanston, Wyoming
April 11, 1981 81-5-1, 2, 3

Form DOGC-1a

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DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS

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1a. Type of Work
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533' FSL & 755' FEL SE SE
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660' FSL & 660' FEL

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Fee

6. If Indian, Allottee or Tribe Name

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Chevron

9. Well No.
1-17B (Deseret Skull)

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(WILDCAT) Subthrust
Thomas Canyon-Cretaceous

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6-7 miles west and north of Evanston, Wyoming

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Rich Utah

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17. No. of acres assigned to this well 640

18. Distance from proposed location* to nearest well, drilling, completed, or applied for, on this lease, ft. No Other Well

19. Proposed depth 17,600

20. Rotary or cable tools Rotary

21. Elevations (Show whether DF, RT, GR, etc.)
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May 1982

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Signed [signature] Title Engineering Assistant Date April 13, 1981

(This space for Federal or State office use)

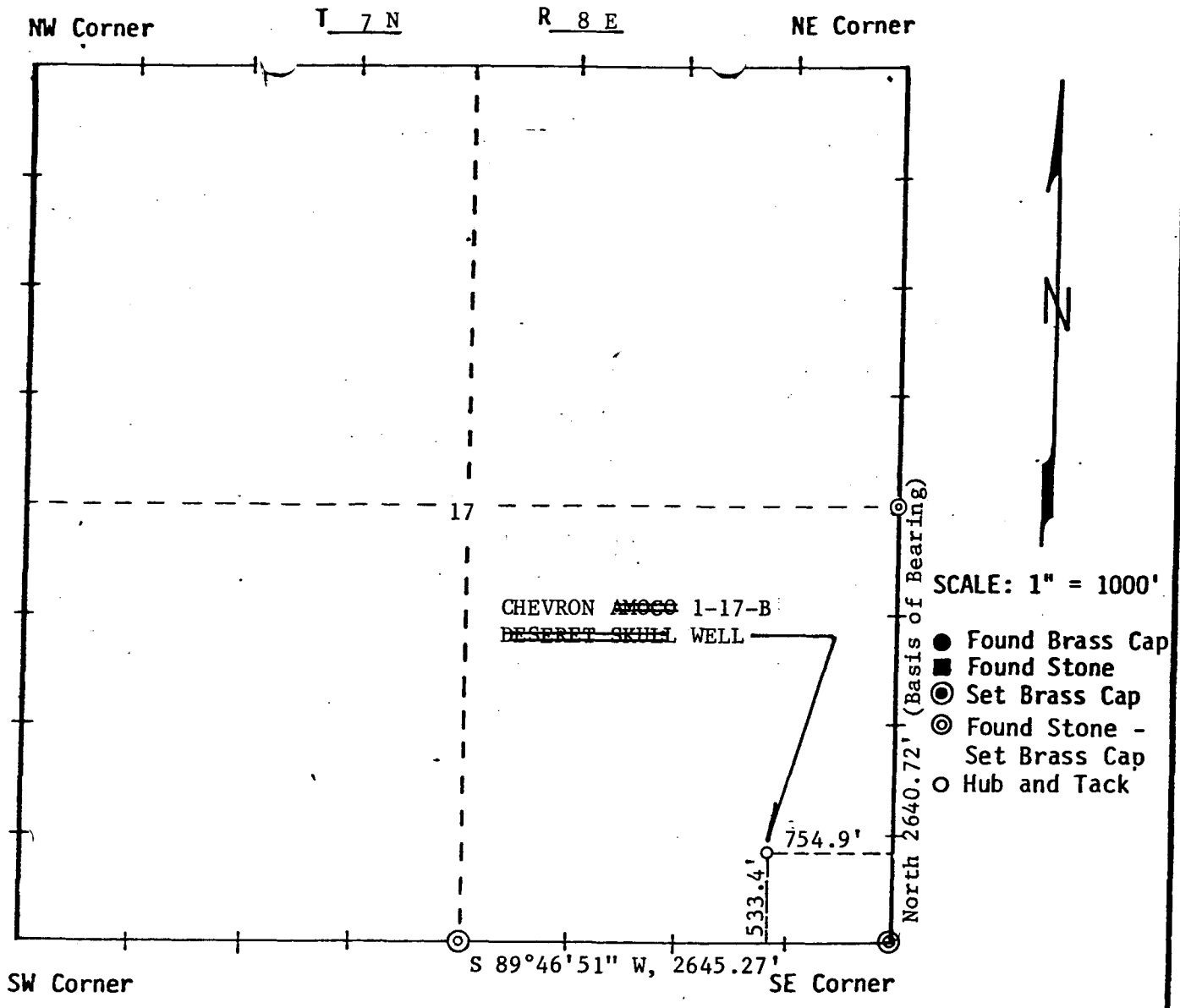
RECEIVED
APR 16 1981
DIVISION OF OIL, GAS & MINING

Permit No. ..... Approval Date .....

APPROVED BY THE STATE OF UTAH DIVISION OF OIL, GAS, AND MINING
DATE: 5/15/81
BY: [signature]

Approved by ..... Title ..... Date .....
Conditions of approval, if any:

See Instructions On Reverse Side



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4-11-81

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DATE: April 11, 1981
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UINTA ENGINEERING & SURVEYING, INC.
808 MAIN STREET, EVANSTON, WYOMING

DRILLING PROCEDURE

Field Thomas Canyon Well Chevron [illegible] 1-17B

Location C SESE Sec 17, T7N, R8E, Rich County, Utah

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Surface Depth	
Intermediate Depth	GR-DLL-MSFL; GR-CNL-FDC-CAL; GR-Sonic (Integ); HDT
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Sour gas potential 13,500 to TD. BHT est 250°F. BHP est 8400 psi. Salt in interval 7400' to 8000'

12. Completion & Remarks: Completion to be based on results of core analysis and wireline log evaluation

Division Development Geologist [illegible] 4/12/82 Division Drilling Superintendent [illegible] 4-13-82
Chief Development Geologist _____ Date

WS-44

* 6 Mission Canyon @15,000; 1 Darby @ 16,800; 2 Bighorn @17,100

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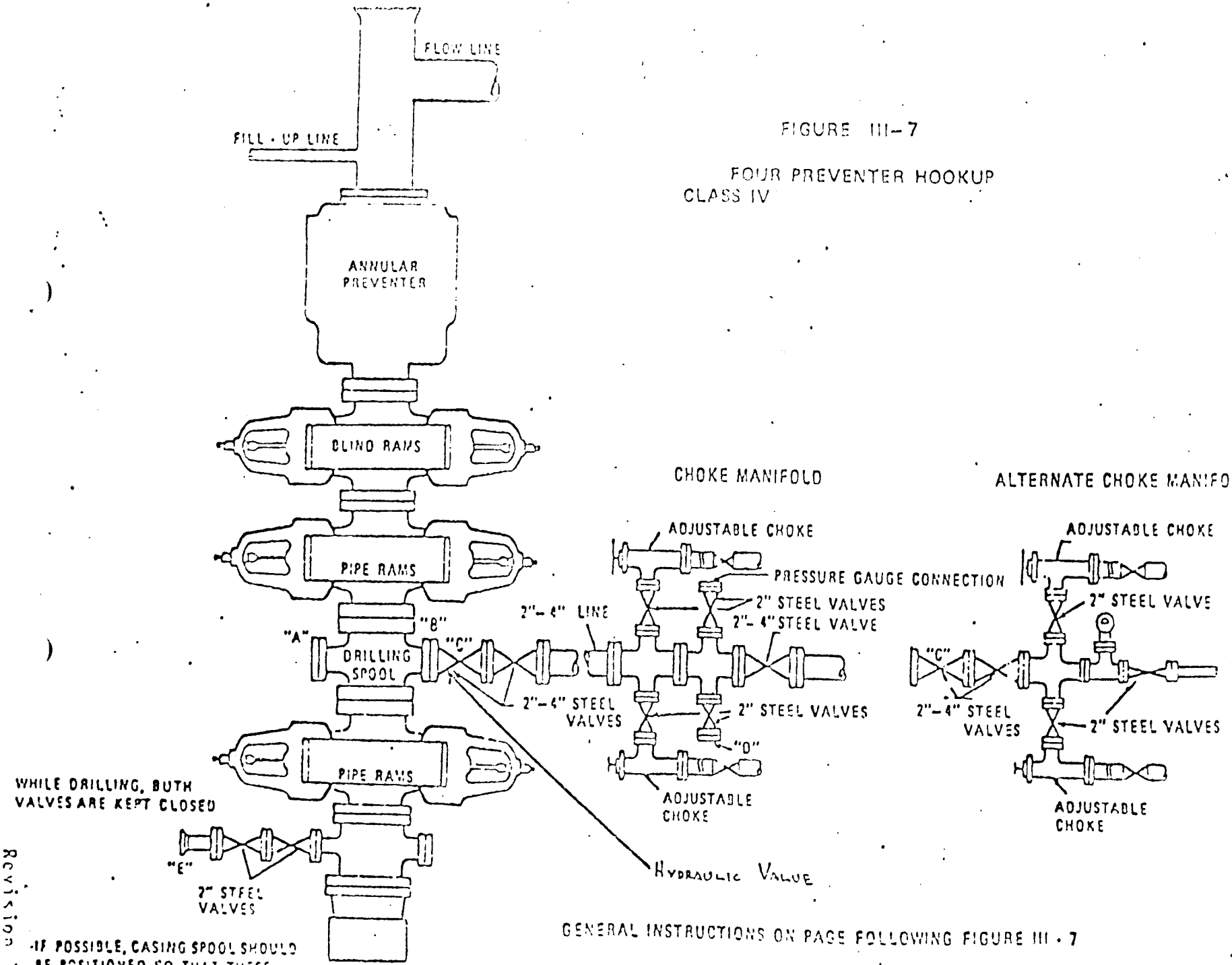
FIGURE III-7

FOUR PREVENTER HOOKUP
CLASS IV



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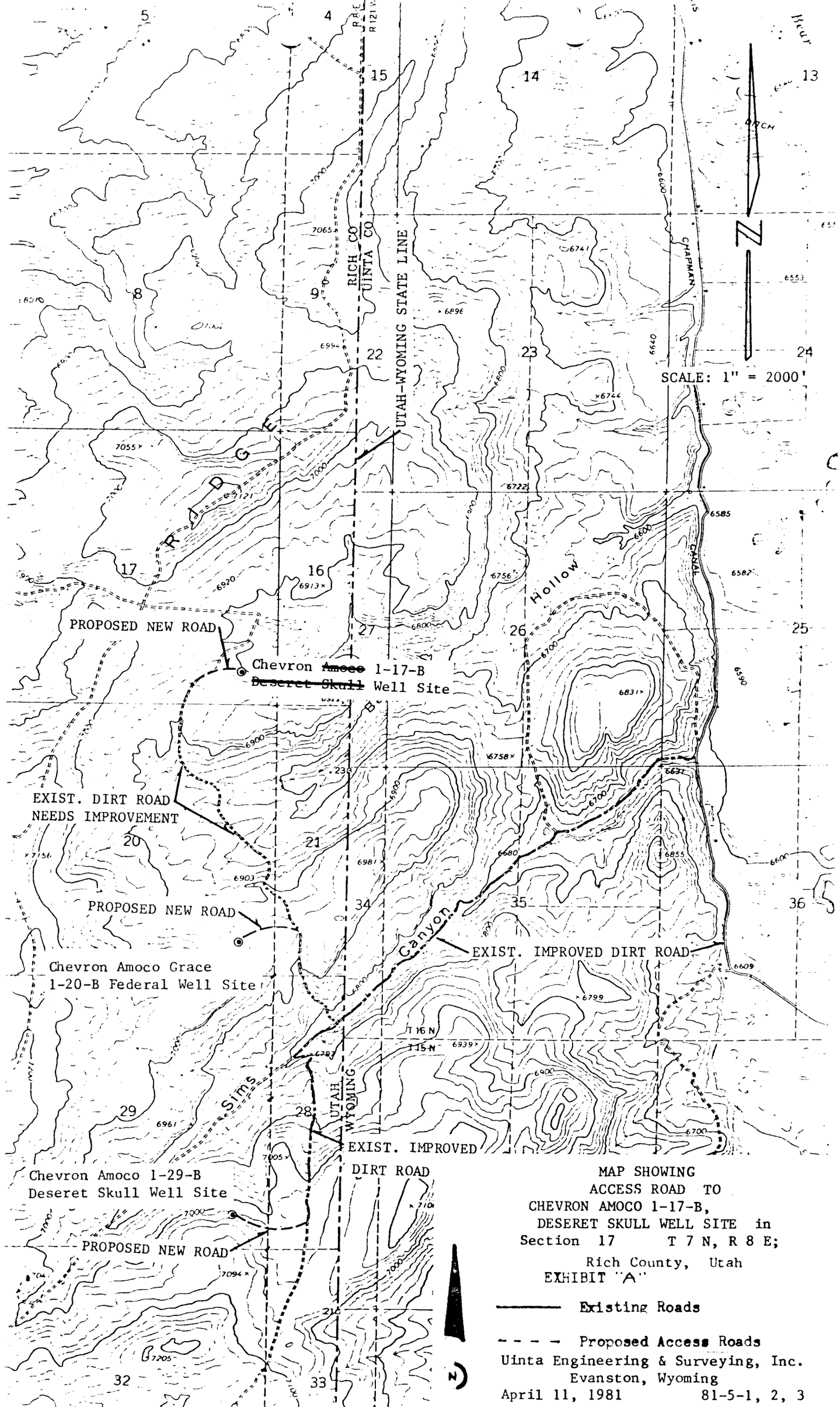

MAP SHOWING
ACCESS ROAD TO
CHEVRON AMOCO 1-17-B,
DESERET SKULL WELL SITE in
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Rich County, Utah
EXHIBIT "A"

——— Existing Roads

- - - - Proposed Access Roads

Uinta Engineering & Surveying, Inc.
Evanston, Wyoming
April 11, 1981 81-5-1, 2, 3

Denver, Colorado
April 20, 1981

CHEVRON 1 - 17B
RICH COUNTY, UTAH

Contingency and Evacuation plan for the protection of personnel and the general public while drilling and/or in the event of a disaster in the presence of H_2S.

CONTINGENCY PLAN

FOR

CHEVRON 1 - 17B

TABLE OF CONTENTS

I. PURPOSE

The purpose of this plan is to safeguard the lives of Company, contract personnel and the general public in the event of equipment failures and/or disaster occasioned by the drilling of formations which may contain H_2S (Hydrogen Sulphide) and CO_2 (Carbon Dioxide).

Chevron U.S.A. Inc. has inaugurated practices and specified materials to be used in drilling of wells to insure the safety of all personnel and the general public within the bounds of current knowledge and equipment available at the present time. No problems are anticipated in safely drilling wells; however, as further precaution, this contingency and evacuation plan has been prepared and adopted to provide a means of insuring the safety of personnel and the general public, should a disaster occur.

II. GENERAL INFORMATION & PHYSIOLOGICAL RESPONSES TO H_2S EXPOSURE*

H_2S is a colorless flammable gas having in low concentrations an odor resembling rotten eggs. However, odor cannot be relied upon as a means of detection since high concentrations or continued exposure to low concentrations tends to paralyze the sense of smell. H_2S is an irritant and extremely toxic gas which is several times deadlier than carbon monoxide and almost as deadly as hydrogen cyanide. The significance of the CO_2 is its ability to extinguish pilot lights and flames and allowing the emission of unburned H_2S.

Low concentrations of H_2S cause headaches. Higher concentrations (0.01 per cent by volume) cause irritations of the eyes, nose, throat and lungs. Eyes become red and swollen, accompanied by sharp pain in more severe cases. Still higher concentrations (0.05 per cent by volume) cause dizziness, unconsciousness and failure of respiration.

H_2S is heavier than air. On still days it tends to accumulate in low places in dangerous concentrations. However, if it is warmer than the surrounding air, it may tend to rise. Thus, personnel working in high places under these conditions should do so with caution!

In a 10 MPH wind a gas plume will travel one mile in six minutes.

The physiological response to various concentrations of H_2S is as follows:

Period of Exposure	Parts of H_2S Per Million Parts of Air	Per Cent By Volume
Maximum allowable concentration for an 8 hour work day	10	0.001
Slight symptoms after several hours of exposure	70-150	0.007-0.015
Maximum concentration that can be inhaled for one hour without serious consequences	170-300	0.017-0.03
Dangerous after exposure of 1/2 hour to 1 hour	400-700	0.04-0.07
Fatal in exposure of 30 minutes	600	0.06
Rapid unconsciousness - Fatal in a few minutes	1000	0.10

*Information taken from PETROLEUM SAFETY DATA FOR MEMBERS AND THEIR ASSOCIATES OF THE AMERICAN PETROLEUM INSTITUTE - Bulletin No. 7, July, 1951, and STANDARD OIL COMPANY OF CALIFORNIA, INDUSTRIAL HYGIENE BULLETIN CONCERNING SULFIDE, January, 1968.

Sulphur Dioxide (SO_2) will be formed with the burning of hydrogen sulfide gas in the vapor phase. This gas, although colorless, can be identified by its characteristic pungent odor. SO_2 is so intensely irritating that concentrations of 3 to 5 parts per million are readily detectable by the normal person. Yet under certain meterological conditions and large volumes, SO_2 may become more dangerous than hydrogen sulfide. Therefore, though the well has been ignited, one cannot be less vigilant, because SO2 can kill.

III. TREATMENT PROCEDURES FOR H_2S POISONING

A. Remove the patient to fresh air.

B. If breathing has ceased or is labored, begin artificial respiration immediately. NOTE: This is quickest and preferred method for clearing patient's lungs of contaminated air. However, under disaster conditions it may not be practical to move patient to fresh air. In such instances, where those rendering first aid must continue to wear masks, a resuscitator should be used.

C. Apply resuscitator to help stimulate H_2S from blood stream. Continue until physician or ambulance arrives.

D. Keep at rest and prevent chilling.

E. Get patient under physician's care as soon as possible.

IV. RESPONSIBILITIES

A. Man-in-charge

To assure the proper and orderly execution of this plan, it is absolutely essential that one man be in complete charge of and responsible for its implementations. The assigned Chevron drilling Representative on location will be this man.

B. Testing

During any testing of the well, such as drill stem test, all gas will be flared and any liquid will be put through a separator for flaring of dissolved gas.

Special procedures and contingency plan for production testing the well after releasing the rig will be established and approved prior to such testing.

C. Head Count

A log of company and contract personnel will be maintained in order to keep an accurate count of the number of and names of people on location at all times. This log shall be maintained as current as possible.

WELLSITE PROCEDURES AND PRECAUTIONS

A. Location

1. Location shall be constructed large enough so that rig can be rigged up to take advantage of prevailing winds.

2. Mud tanks, shale shaker, degasser, solids removal equipment and reserve pit should be located downwind and away from substructure to provide for more ventilation.

B. Blowout Preventor Requirements

The BOP hookup shall include 3 ram type, a Hydril and choke manifold, all 5000 psi W.P. minimum, which meets Chevron's specifications for H_2S service. The contractor shall furnish to Chevron certification by the manufacturer and/or rental agency that the equipment is certified for H_2S service.

C. Blowout Preventor Pit Drills

Pit drills are for the purpose of acquainting each member of the drilling crew with his duties in the event an emergency arises. Drills will be held with each crew initially as frequently as required to thoroughly familiarize each man with his duties. Drills are to be held at least weekly after entering a formation known to contain H_2S.

D. Warning System

1. Wind Direction

(a) Wind socks to be installed in open area easily visible from rig.

(b) Colored streamers will be tied to each flare.

(c) Appropriate warning signs and flags will be placed at all entrances to the location.

2. Kick Indicators

(a) Trip tank to be used on trips to determine that the hole is being filled properly.

(b) Flow indicator to indicate that the flow returns are neither gaining or dropping off.

(c) Pit Volume Totalizer (PVT).

PVT continuously records pit volume and sounds alarm when a preset gain or less in pit volume is indicated. A second monitor for the PVT will be located in the mud logging unit. Mud logging personnel will immediately notify driller of any alarm.

3. H_2S Detection

   (a) An H_2S detector will continuously monitor air from a fan at the mud shaker and bell nipple. Concentrations less than 10 PPM will be detected.

   (b) Ample supplies of 8-hr H_2S ampules will be kept on location. All personnel will attach the crushed ampule to their person in a place where a quick glance will provide warning of H_2S contamination.

   (c) A "sniffer" will also be kept available. This as well as the H_2S ampules should be used to check for H_2S contamination if the mud logging unit indicates the need.

4. From top of the H_2S bearing formation to TD drilling engineer or foreman in charge shall consult daily with the wellsite development geologist or mud loggers for any changes in geologic markers indicating possible changes in important formation tops.

E. Protection of Personnel

Training Program

1. All personnel shall be instructed in the proper use of personal safety equipment, H_2S detectors and alarms, briefing areas, evacuation procedures and prevailing winds. Training of all personnel, whether regularly assigned, contract or employed on an unscheduled basis shall be carried out by the contract safety supervisor assigned to the location.

2. A drill and training session will be conducted every two weeks and recorded on the driller's log.

3. Two briefing areas will be designated for assembly of personnel during emergency conditions, located so one is up-wind of the well at all times. Personnel shall be trained to practice routine observation of wind direction.

4. The Chevron Drilling Representative shall be responsible for the overall operation of on-site safety and training programs.

Personnel Protective Equipment

1. All working personnel on a facility shall be equipped with proper protective-breathing apparatus. The operator shall provide such equipment for the normal number of personnel involved in the operation. The operator is not required to furnish protective-breathing equipment for service personnel, but he is required to inform service contractors of the necessity of having this equipment, when called to the location. Light-weight, escape-type, self-contained breathing apparatus with a minimum of 5 minute's supply must be maintained at an easily accessible location for the derrickman, and at any other location where escape from an H_2S atmosphere would be difficult.

1. (Cont'd.)
Additional protective breathing apparatus of the pressure-demand or continuous-flow type (full face piece supplying breathing quality air for an extended period while maintaining a slight pressure inside the system) shall be provided for all essential crew members. Such equipment will conform to Occupational Safety and Health Administration Standards 29 CFR 1910.132, Subpart I, Personal Protective Equipment, and American National Standard Practices for Respiratory Protection Z88.2.

2. Storage of protective-breathing apparatus shall be planned to assure at least one available apparatus regardless of current wind conditions. The contract safety supervisor will be responsible for maintenance of all safety equipment.

3. Each system must have an alarm signal for low air supply.

4. All personnel are to have ear plugs. Those with punctured eardrums must wear ear plugs to survive.

5. Additional personnel safety equipment must be available for use:
   (a) Chalk boards and note pads for communication
   (b) First-aid supplies
   (c) Resuscitators
   (d) Litter

6. Large explosion-proof mechanical blowers shall be used to direct vapors in the desired direction as protection against calm or extremely light winds. Use of such ventilation equipment shall be provided in work areas where H_2S vapors might accumulate and need to be dispersed. (NOTE: This will be incorporated in our Contingency Plan).

Visible Warning System

Operational danger signs shall be displayed on each entrance to the location complete with flags. The signs with flags will indicate the following conditions and requirements:

1. Green Flag - Moderate danger. When the concentration reaches 20 ppm H_2S, the signs will be displayed. The detection efforts shall be intensified, and steps taken to eliminate or neutralize the condition.

2. Yellow Flag - Intermediate danger. When H_2S is determined to be in the 20-100 ppm range, the flage shall be hoisted, protective breathing apparatus shall be worn by all working personnel, and all non-working personnel moved to safe areas.

3. Red Flag - Extreme danger. When H_2S has exceeded 100 ppm concentration, all non-essential personnel or all personnel (as appropriate) shall be evacuated.

4. During the time when the well is being production tested or when extreme danger conditions exist, the entrances to the location will be blocked and a guard posted to keep out all non-essential personnel.

F. Communication

1. Telephones

(a) A telephone will be installed in Chevron and Tool Pushers trailers on location and mud logging unit on the same line.

2. Six (6) two-way walkie-talkie type radios will be in the Chevron trailer, prior to entering the H_2S Formation, for use as a portable communication system.

G. General

1. Flare System - Two flares shall be positioned with respect to the rig such that one or the other will be downwind of the rig at all times. The flare stacks will be a minimum of 16' in height.

(a) All choke manifolding, the mud gas separator vent and the degasser vent shall be tied into the flare system. The pipe to both flares will be adequate size so that minimum back pressure will be had.

(b) A continuous pilot fed by LPG shall be maintained at each flare.

(c) Backup ignition for each flare shall be provided by:

1) Automatic ignitors on each flare.

2) Very Pistols (one in Chevron trailer, one in tool pushers' trailer).

2. H_2S is normally heavier than air and thus seeks low places. For this reason, calm days can be more dangerous than windy days since high concentrations can accumulate in the lows over a period of time.

CAUTION! If the H_2S is warmer than the surrounding air (as it probably will be during the winter months) then it will rise. In this case the derrickman is vulnerable and should frequently monitor high position.

3. When H_2S contamination is present, work in pairs - the buddy system - insofar as possible!

4. Absolutely no smoking when H_2S contamination is present. H_2S is highly flammable!

Smoking during normal operations should be allowed only in designated areas.

VI. PROTECTION AND EVACUATION OF THE GENERAL PUBLIC

A. Contingency Plan

1. Before reaching the top of the H_2S bearing Formation, (minimum of 1000 feet above) the following measures are to be put into effect:

   (a) Zinc carbonate shall be added to the mud as an H_2S scavenger. The mud returns will be monitored frequently with zinc carbonate added as needed to maintain a residual (2-3# 1 bbl). This treatment will be continued to TD.

   (b) A safety meeting with Chevron personnel, each crew and tool pusher and mud loggers will be held covering use of SCBA, resuscitator, first aid, etc. Notify Division Office at least 48 hours before meeting so appropriate personnel can attend meeting.

   (c) Post in conspicuous form at telephone station the phone number of:

   1. Sheriff's Office
   2. Ambulance Service
   3. Hospital
   4. Doctors' Numbers
   5. Highway Patrol
   6. Residents within 2-mile radius

B. Evacuation Plan

1. Kick

   Action will be withheld pending further development.

2. Blowout or Imminent Blowout

   If, in the judgment of the man-in-charge, it is practically certain that a blowout will occur or it happens almost instantaneously, the following procedures will be put into effect:

   (a) Evacuate well site personnel.

   (b) Chevron man-in-charge will set well on fire.

   (c) All personnel evacuating drillsite will wear SCBA if possible.

   (d) Vehicles of key personnel will be supplied with H_2S indicator ampules prior to entering the H_2S formation.

   (e) If location is evacuated and/or set fire, the Chevron man-in-charge and tool pusher will remain as near location as possible to assure against flameout. Keep local authorities informed of developments and needs through telephone or mobile radio contact.

   (f) Notify by phone or in person all residents within a 2-mile radius of the well, see list of Emergency Phone Numbers.

C. Evacuation of General Public

1. Before drilling into the H_2S Formation, all residents within a 2-mile radius will be alerted as to the potential danger.

2. The Highway Patrol Office and County Sheriff's Office will be requested to help in stopping unnecessary traffic moving toward the location.

3. General

(a) Chevron desires to cooperate with these authorities to the fullest extent and will exert every effort by careful advice to such authorities to prevent panic or the spread of wild rumors.

Since it is desirable to have one Company source of information in such instances, we will attempt to have the Chevron Public Relations Coordinator at the disaster as soon as possible. The man-in-charge will keep the Public Relations Coordinator fully informed at all times and will be responsible for obtaining such information as he may require.

Until such time as the Public Relations Coordinator has arrived, Chevron personnel will cooperate with and provide such information to civil authorities as they might require.

(b) Since one of the products of the combustion of hydrogen sulfide gas is sulphur dioxide (SO_2), under certain conditions, this gas may be equally as dangerous as H_2S. A "sniffer" type device, which determines the per cent of SO_2 in air and concentrations in PPM, will be at hand upon entering the top of the H_2S Formation. Although normal air movement is sufficient to dilute this material to safe levels, the SO_2 detector should be utilized to check concentrations in the proximity of the well once every 8 hr. shift. Also, if any low areas are suspected of having high concentrations, personnel should be made aware of these areas if they are found to have hazardous concentrations.

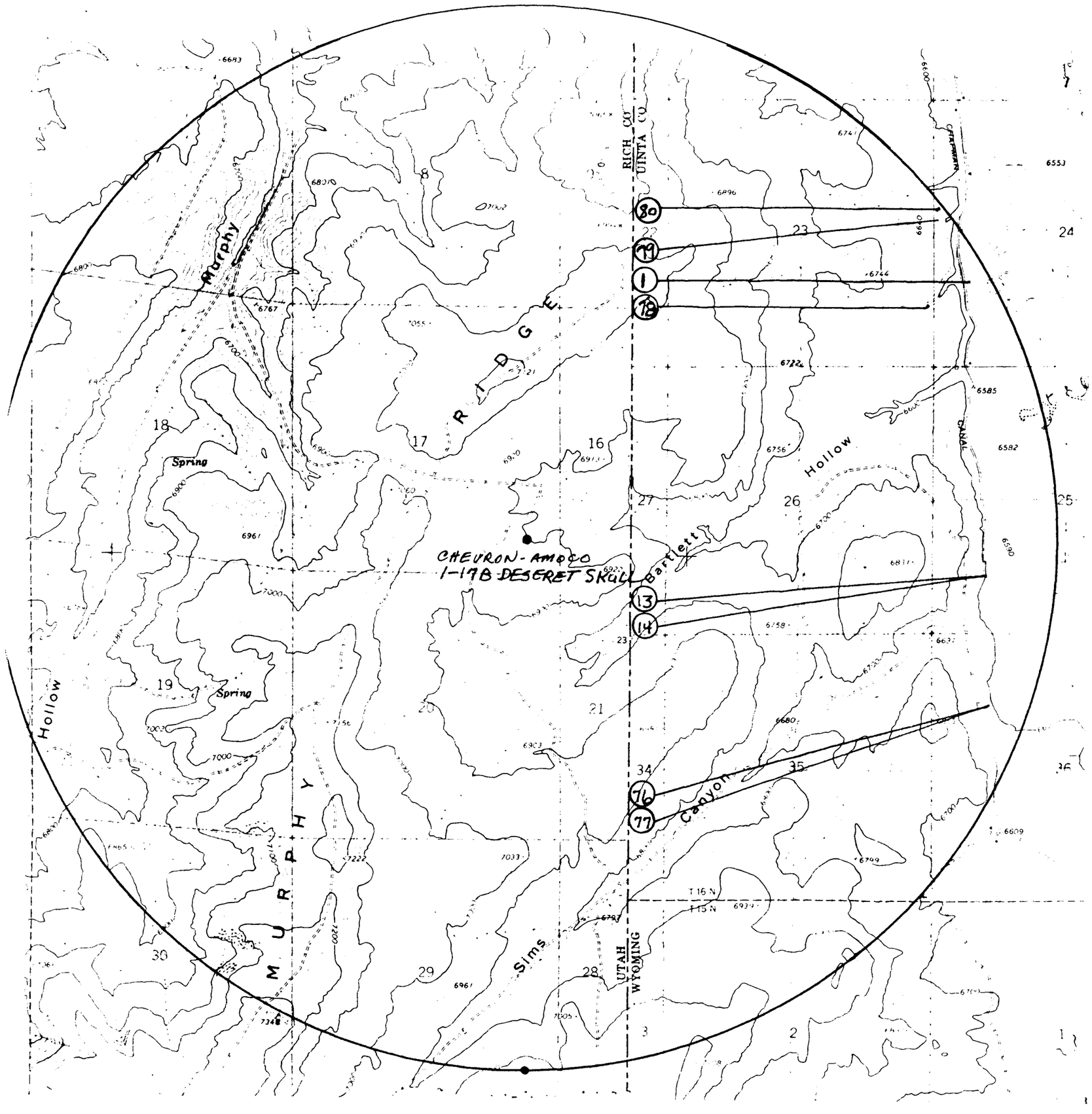
(c) In the event it is necessary to evacuate any local residents, it is the responsibility of the man-in-charge to see to it that they find suitable housing such as a nearby motel.

VII. EMERGENCY PHONE NUMBERS

Sheriff's Office	911 or 789-2331
Ambulance	789-9032
Hospital	789-3636
Highway Patrol	789-2558
Doctors:	
Dr. Bill Cooper	789-3636
Dr. Steven French	789-3636
Dr. J. A. Morse	789-3940
Dr. A. Tesoro	789-3748
	Res. 789-2850
USGS District Engineer	307-362-6422
	Res. 307-362-2037
BLM Chief, Division of Operations	307-382-5350

Listed below are those residents within the area of a 2 mile radius of Chevron 1-17B in Rich County, Utah. Location of each resident is shown on the attached map by corresponding number with each name on the list.

1.	Hubert Faddis	
13.	Roger Pierce	789-3524
14.	Morgan Pierce	- Trailer
76.	Trailer	-
77.	Trailer	789-4950
78.	Gordon Moore	789-4256
79.	Stevens	
80.	Frac Tanks	



NOTE - NUMBERS CORRESPOND TO RESIDENT LIST ON PAGE 11.

N

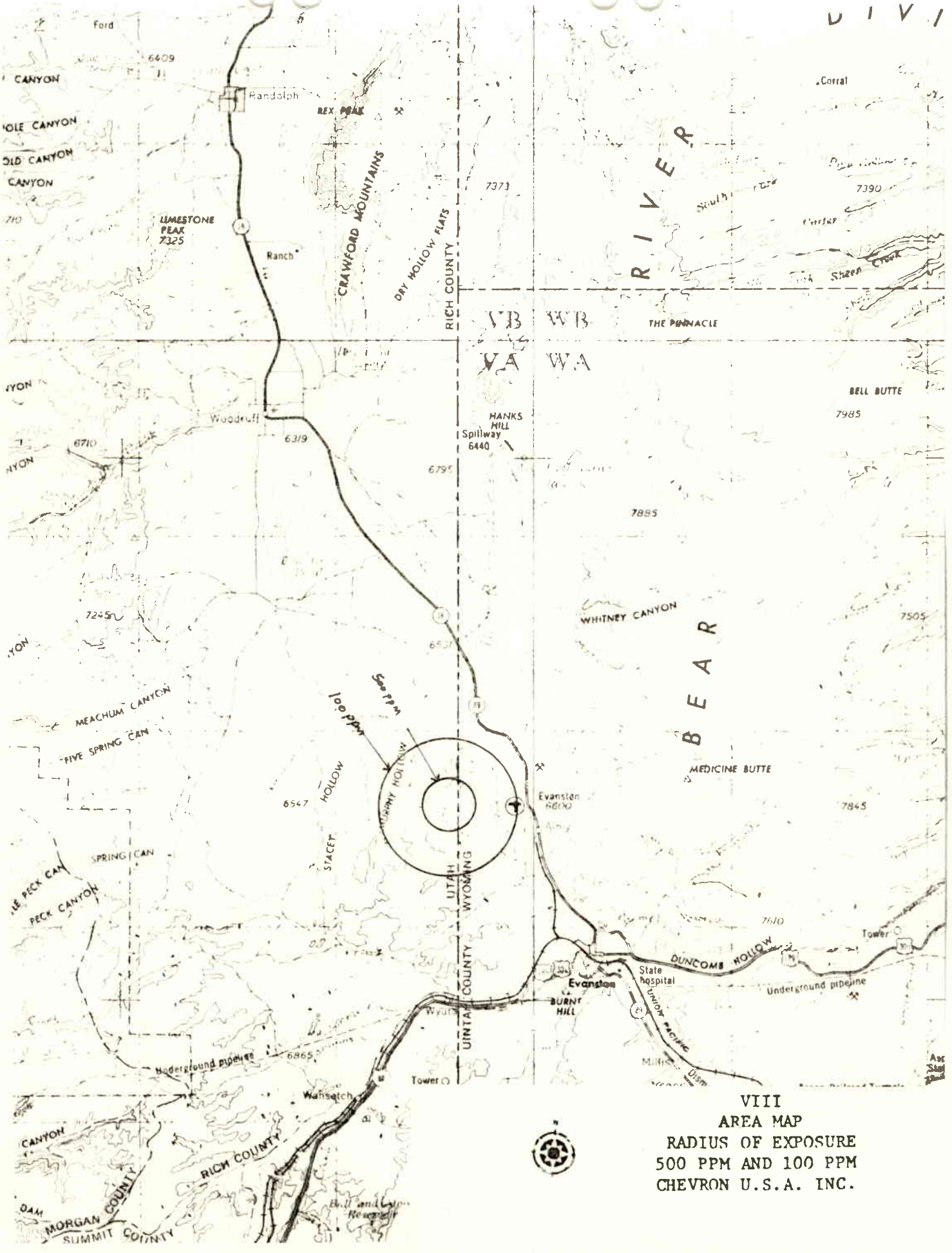
S

2 - MILE RADIUS MAP

CHEVRON U S A INC.

CHEVRON 1 - 17B

THE SESE, SEC. 17,
T7N, R8E,
RICH COUNTY, UTAH



VIII
AREA MAP
RADIUS OF EXPOSURE
500 PPM AND 100 PPM
CHEVRON U.S.A. INC.

CONVERSION FACTORS FOR H_2S IN NATURAL GAS

GIVEN	REQUIRED		
	Grains per 100 Cu. ft.	Parts per Million	Mol Percent
Grains Per 100 $ft.^3$	—	Grains ÷ (0.05341 x S.G)	Grains x 0.00159
Parts Per Million	PPM x 0.05341 x S.G.	—	PPM x Sp. Gr. ÷ 1.177×10^4
Mol Percent	Mol % ÷ 0.0015908	(Mol % x 1.177×10^4) ÷ Sp. Gr.	—
EXAMPLE (0.6 SPECIFIC GRAVITY GAS)			
1 Grain / 100 $ft.^3$	—	1 - (0.05341 x 0.6) = 31.20	1 x 0.00159 = 0.00159
1 Part / Million	1 x 0.05341 x 0.6 = 0.032	—	1 x 0.6 ÷ 1.177×10^4 = 5.1 x 10
1 Mol %	$\frac{1}{0.0015908}$ = 628.6	1 x 1.177×10^4 ÷ 0.6 = 19,617	—
EXAMPLE (0.7 SPECIFIC GRAVITY GAS)			
1 Grain / 100 $ft.^3$	—	1 ÷ (0.05341 x 0.7) = 26.75	1 x 0.00159 = 0.00159
1 Part / Million	1 x 0.05341 x 0.7 = 0.037	—	1 x 0.7 ÷ 1.177×10^4 = 5.9×10^{-5}
1 Mol %	1 ÷ 0.0015908 = 628.6	1 x 1.177×10^4 ÷ 0.7 = 16,814.	—
EXAMPLE (0.8 SPECIFIC GRAVITY GAS)			
1 Grain / 100 $ft.^3$	—	1 ÷ (0.05341 x 0.8) = 23.40	1 x 0.00159 = 0.00159
1 Part / Million	1 x 0.05341 x 0.8 = 0.043	—	1 x 0.8 ÷ 1.177×10^4 = 6.8 x 10
1 Mol %	1 ÷ 0.0015908 = 628.6	1 x [illegible]77 x 10^4 ÷ 0.8 = 14,713	—

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API
RECOMMENDED PRACTICES
FOR

SAFE DRILLING OF WELLS CONTAINING HYDROGEN SULFIDE

OFFICIAL PUBLICATION

REG U S PATENT OFFICE

AMERICAN PETROLEUM INSTITUTE
Washington, D. C.

Issued by
AMERICAN PETROLEUM INSTITUTE
Production Department
300 Corrigan Tower Building
Dallas, Texas 75201

API RECOMMENDED PRACTICES FOR SAFE DRILLING OF WELLS CONTAINING HYDROGEN SULFIDE

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J. V. Langston, *Chairman*, Exxon Company, U.S.A., Houston, Texas
J. E. Edison, Sun Oil Co., Tulsa, Okla.
Hugh Elkins, Hydril Co., Houston, Texas
C. C. Evans, Atlantic Richfield Co., Corpus Christi, Texas
H. H. Hershey, Shell Oil Co., New Orleans, La.
G. B. Kitchel, Transworld Drilling Co., Houston, Texas
Sam E. Loy, III, Exxon Company, U.S.A., Houston, Texas
W. R. Malson, Loffland Brothers Co., Odessa, Texas
J. D. McLain, C. Jim Stewart & Stevenson, Inc. Houston, Texas
Bill Meinecke, FMC Corp., WECO Div., Houston, Texas
Paul Rininger, Santa Fe Engineering Services, Orange, Calif.
M. G. Schaafsma, Asiatic Petroleum Co., Houston, Texas
John Shore, Chevron Oil Field Research Co., La Habra, Calif.
R. W. Yarbrough, Union Oil Co. of Calif., Los Angeles, Calif.

API RECOMMENDED PRACTICES FOR SAFE DRILLING OF WELLS CONTAINING HYDROGEN SULFIDE

FOREWORD

a. Initial efforts to develop a publication related to this overall subject were begun and advanced by a work group of the Production Safety Committee under API's Committee on Safety and Fire Protection. Because of the "non-divisional status" of the Committee on Safety and Fire Protection, a decision was reached to refer their draft material to the Division of Production for further work and final approval as an official API publication.

b. This recommended practice was finalized by the Subcommittee on Blowout Prevention Equipment Systems, the membership of which is listed on the preceding page. It is published under the sponsorship of the Executive Committee on Drilling and Production Practice of the American Petroleum Institute's Division of Production.

c. This recommended practice prescribes safety recommendations and outlines safety guidelines and procedures developed within the petroleum industry for conducting inland or offshore drilling operations where hydrogen sulfide gas may be encountered.

SECTION 1

SCOPE

1.1 Drilling operations where hydrogen sulfide may be encountered should include provisions to use the safety guidelines outlined in this publication. These guidelines should be administered where there is a reasonable expectation that hydrogen sulfide gas bearing zones will be encountered that could potentially result in atmospheric concentration of 20 ppm or more of hydrogen sulfide. These are requirements for deep, high pressure wells located in or near a populated area.

1.2 Several factors, including but not limited to hydrogen sulfide content, potential surface pressure, potential flow characteristics, and geographical location, may dictate modifications or exceptions to the recommendations set forth herein. These safety recommendations have been developed, considering land locations with unconfined areal boundaries, to safeguard personnel at the rig site and surrounding area and to minimize risk exposure to rig equipment. Recognizing that there are many locations with confined boundaries (such as locations found in marsh, marine, urban, and mountainous areas), attention should be given to safety recommendations resulting from these geographical limitations. Additional safety guidelines for these confined locations are set forth under Section 4, "Location".

1.3 Recommended safety procedures on rank wildcat drilling operations should be initiated immediately after setting of the intermediate casing string. On development wells or wells where knowledge of formation type allows good correlation, recommended safety procedures should begin well in advance of reaching a depth where hydrogen sulfide may be encountered.

SECTION 2

INTRODUCTION

2.1 The demand for hydrocarbons necessitates the drilling of deep, high pressure wells which may contain hydrogen sulfide. If hydrogen sulfide is encountered, the concentration of hydrogen sulfide involved may present hazards abnormal to routine drilling activities. Drilling operations involving high hydrogen sulfide concentrations present problems involving personnel and equipment which require special precautions by the petroleum industry due to the extremely acidic and toxic nature of hydrogen sulfide. Design of drilling equipment must include consideration of its possible exposure to hydrogen sulfide.

2.2 The petroleum industry, through experience and effort, has developed guidelines for safe drilling operations under conditions involving hydrogen sulfide. However, continuous industry effort including meticulous planning, careful equipment selection and layout, development of detailed operating procedures and emergency procedures, provision of appropriate safety equipment, and intensive personnel training are necessary to ensure successful and safe operations. All effective countermeasures to emergencies imply some degree of prior planning. The effectiveness of emergency countermeasures is usually proportionate to the thoroughness and soundness of the planning effort.

SECTION 3

HYDROGEN SULFIDE PHYSICAL PROPERTIES AND TOXICITY

3.1 *Hydrogen sulfide is extremely toxic.* The acceptable ceiling concentration for eight-hour exposure is 20 ppm, which is .002% by volume. Hydrogen sulfide is heavier than air (specific gravity = 1.192) and colorless. It forms an explosive mixture with air between 4.3 and 46.0 percent by volume. Hydrogen sulfide is almost as toxic as hydrogen cyanide and is between five and six times more toxic than carbon monoxide. Toxicity data for hydrogen sulfide and various other gases are compared in Table I. Physical effects at various hydrogen sulfide exposure levels are presented in Table II.

TABLE I
TOXICITY OF VARIOUS GASES

Common Name	Chemical Formula	Specific Gravity (SG) SG Air = 1	Threshold[1] Limit	Hazardous[2] Limit	Lethal[3] Concentration
Hydrogen Cyanide	HCN	0.94	10 ppm	150 ppm/hr	300 ppm
Hydrogen Sulfide	H_2S	1.18	10 ppm[4] 20 ppm[5]	250 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21	5 ppm	—	1000 ppm
Chlorine	Cl_2	2.45	1 ppm	4 ppm/hr	1000 ppm
Carbon Monoxide	CO	0.97	50 ppm	400 ppm/hr	1000 ppm
Carbon Dioxide	CO_2	1.52	5000 ppm	5%	10%
Methane	CH_4	0.55	90,000 ppm (9%)	Combustible above 5% in Air	—

[1]Threshold Limit—concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.

[2]Hazardous Limit—concentration that may cause death.

[3]Lethal Concentration—concentration that will cause death with short-term exposure.

[4]Threshold Limit = 10 PPM—1972 ACGIH (American Conference of Governmental Industrial Hygienists).

[5]Threshold Limit = 20 PPM—1966 ANSI acceptable ceiling concentration for eight-hour exposure (based on 40-hour week) is 20 PPM. OSHA Rules and Regulations (Federal Register, Volume 37, No. 202, Part II, dated October 18, 1972).

TABLE II
PHYSICAL EFFECTS OF HYDROGEN SULFIDE*

Concentration			
percent (%)	ppm	grains/ 100 std. ft.^{3}**	Physical Effects
0.001	10	.65	Obvious and unpleasant odor.
0.002	20	1.30	Safe for 8 hours exposure.
0.01	100	6.48	Kills smell in 3 to 15 minutes; may sting eyes and throat.
0.02	200	12.96	Kills smell shortly; stings eyes and throat.
0.05	500	32.96	Dizziness; breathing ceases in a few minutes; needs prompt artificial respiration.
0.07	700	45.36	Unconscious quickly; death will result if not rescued promptly.
0.10	1000	64.80	Unconscious at once; followed by death within minutes.

**Caution:* Hydrogen sulfide is a colorless and transparent gas and is flammable. It is heavier than air and may accumulate in low places.

**At 15.00 psia and 60 F.

SECTION 4

LOCATIONS

LOCATIONS WITH UNCONFINED BOUNDARIES

4.1 Drilling locations with unconfined boundaries are usually found on land where a typical rig layout can be planned as shown in Fig. 1. Such locations should be planned to obtain maximum safety benefits consistent with rig configurations, terrain, and prevailing winds. Rig components should be arranged on the location so the prevailing wind will blow across the rig toward the reserve pit(s).

4.2 The entrance to the location should be designed so that it can be barricaded if hydrogen sulfide emergency conditions arise. An auxiliary exit (or entrance) should be available so that in case of a catastrophe a shift in wind direction would not preclude escape from the location. Appropriate warning signs and flags should be placed at all location entrances.

4.3 Prevailing wind data should be considered in locating protection centers and briefing areas (sheds or trailers) on either side of the location 200 feet or more from the wellbore so they offset prevailing winds perpendicularly, or at a 45-degree angle if wind direction tends to shift in the area. Personnel protective equipment should be stored in both protection centers or if a movable trailer is used, it should be kept upwind of existing winds. When wind is from the prevailing direction, both protection centers should be accessible. If the wind is quartering, one center should always be accessible. If needed in a crisis, materials and protective equipment located in a downwind protection center may be moved up-

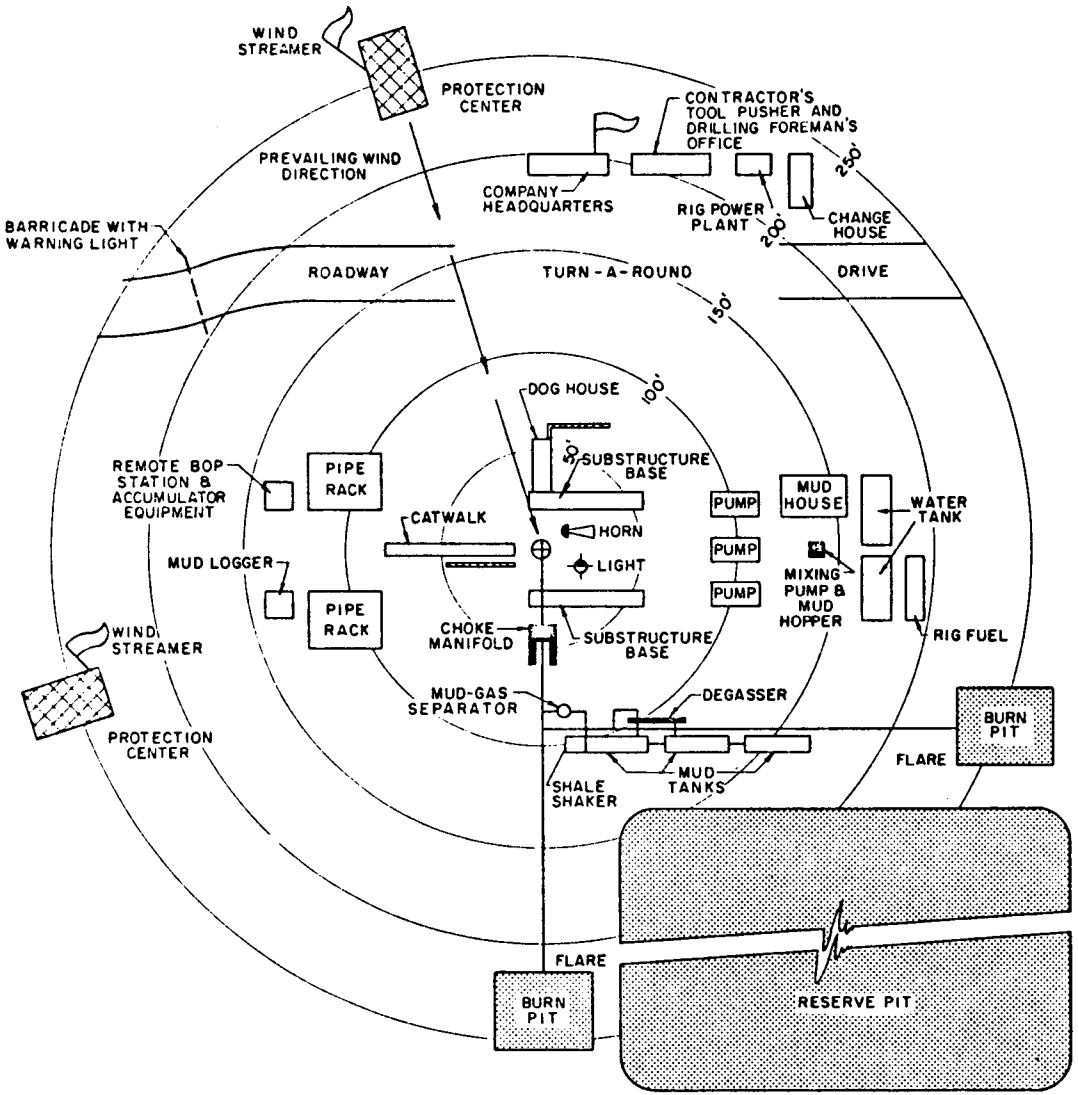

FIG. 1
TYPICAL DRILLING EQUIPMENT
LAYOUT—UNCONFINED LOCATION

wind after donning adequate protective equipment. An equipment trailer or other similar structure can be utilized as a third protection center under such emergency conditions. Upon recognition of an emergency situation, all personnel should assemble at the designated protection center for instructions.

4.4 All equipment should be located and spaced to take advantage of prevailing winds and to provide for good air movement (see Fig. 1). Eliminate as many sources of potential gas accumulation as possible in this manner.

4.5 A windsock should be installed on top of the derrick and at least three sets of wind streamers on streamer poles should be displayed, one set at the location entrance and one set at each of the location protection centers. Personnel should develop wind direction consciousness. Personnel should cultivate the habit of quickly moving upwind in the event of any emergency involving release of gas.

4.6 Large blowers or fans (bug blowers) should be used to direct vapors in the desired direction as protection against calm or extremely light winds. Use of such blower ventilation equipment should be considered on the rig floor, around the derrick substructure, at the shale shaker, and at any other points where hydrogen sulfide might accumulate and need to be dispersed.

4.7 The mud logging trailer should be located away from the shale shaker mud tank and a minimum of 125 feet from the wellbore.

4.8 Shale shaker mud tanks should be located so as to minimize the danger from any gas that breaks out of the drilling fluid.

4.9 Electric power plant(s) should be located as far from the wellbore as practical so that it may be used under conditions where it otherwise would have to be shut down. All electric wiring, devices, and lights should conform to the National Electrical Code according to the classified area surrounding drilling rigs as set out in *API RP 500B**. The drilling location should be adequately lighted at night. Consideration should be given to having available an emergency lighting system such as a battery pack floodlight.

4.10 Burn pits should be located at 90 degrees to each other to allow reduction of inherent hazards by changing from one pit to the other if the wind direction changes. Adequate space should be cleared of brush and grass around flares and burn pits to prevent fires.

4.11 Appropriate "No Smoking" signs should be exhibited at strategic points around the rig site. Smoking should not be permitted in specific areas adjacent to the wellbore, rig floor, and mud pits.

4.12 If the drilling location is fairly remote and several hours from available help and additional safety equipment or supplies, planning considerations should be given to additional contingency items such as extra bottled breathing air or a high pressure compressor for recharging breathing air bottles, a 24-hour communication center, and additional first-aid supplies.

**API RP 500B: API Recommended Practice for Classification of Areas for Electrical Installations at Drilling Rigs and Production Facilities on Land and on Marine Fixed and Mobile Platforms*, Second Edition, July 1973, is available from API Division of Production, 300 Corrigan Tower Bldg., Dallas, Texas 75201.

LOCATIONS WITH CONFINED BOUNDARIES

4.13 Drilling locations with confined boundaries are usually found in marsh, marine, urban, or mountainous areas. A typical rig layout for such confined drilling locations is illustrated in Fig. 2. A number of special considerations should be given these type locations due to their geographical limitations.

4.14 The location entrance should be designed so that it can be barricaded if hydrogen sulfide emergency conditions arise. An auxiliary exit (or entrance) should be available so that in case of a catastrophe, a shift in wind direction would not preclude escape from the location.

4.15 Protection centers and briefing areas for confined locations should be located on each side of the location as far from the wellbore as is practical. When wind is from the prevailing direction, both protection centers should be accessible. On marine locations, the heliport deck and the bow or stern of the drilling vessel should be considered for locating protection centers. Upon recognition of an emergency situation, all personnel should assemble at the designated protection center for instruction.

4.16 Warning signs, warning flags (or balls), windsocks, and wind streamers should be displayed so as to be visible from as many points as practical on the ground, maindeck, rig floor, boats, or helicopters. Possible locations for these items are the derrick, hilltop, mast, heliport, and bow or stern of the drilling vessel.

4.17 In many instances, the location of the shale shaker, mud tanks, and mud logging trailer will be permanently fixed in close proximity to the wellbore. Adequate hazard warning signs should be posted in these areas and alternate personnel escape routes should be planned in the location layout. Additional mechanical blowers (fans) placed in these locations can help to reduce the risk exposure.

4.18 Flare lines should be as long as possible, commensurate with the location geographical limitations. One flare line should be installed perpendicular to the prevailing wind direction and another flare line should be installed parallel to the prevailing wind direction, if practical. An exception to this might be on a "ship-shape" floating drilling vessel where flare lines installed to the bow and stern of the ship would be the best arrangement. Flare lines should be secured with chains and boomers or other suitable means if ground staking is not possible.

4.19 If the drilling location is fairly remote and several hours from available help and additional safety equipment or supplies, planning considerations should be given to additional contingency items such as extra bottled breathing air or a high pressure compressor for recharging breathing air bottles, a 24-hour communication center, and additional first-aid supplies.

SECTION 5

RIG EQUIPMENT

DRILL PIPE

5.1 Steel drill pipe for use in a hydrogen sulfide environment should be constructed of material having a yield strength of 95,000 psi or less, because of the potential material embrittlement problems. Drill stem joints near the top of the drill string are nor-

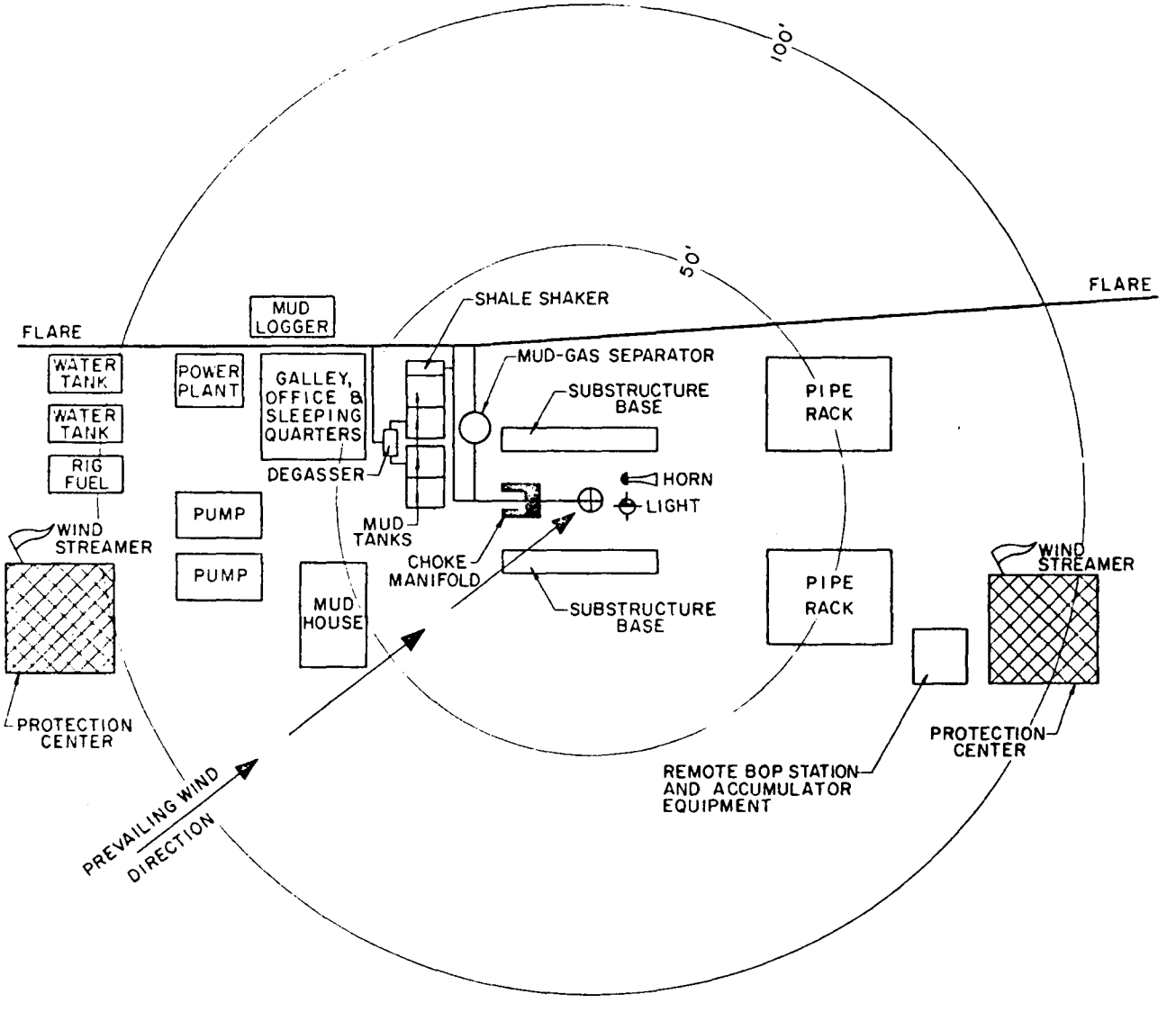

FIG. 2
TYPICAL DRILLING EQUIPMENT
LAYOUT—CONFINED LOCATION

mally under the highest stress levels during drilling operations and do not have the protection of elevated downhole temperatures. These factors should be considered in the overall selection and design of the drill string to be used in a hydrogen sulfide environment. Drill collars normally operate at an elevated downhole temperature. Due to the elevated temperature and with all other factors being equal, drill collars are not as susceptible to embrittlement if exposed to a hydrogen sulfide environment.

BLOWOUT PREVENTION EQUIPMENT

5.2 Blowout preventers should meet or exceed the recommendations for hydrogen sulfide service as set forth in the latest edition of *API Bulletin D13** (currently being revised). Manufacturer certification of the blowout preventer equipment for hydrogen sulfide service is desirable. On extremely hazardous wells, a special auxiliary kill line $2\frac{1}{2}$" or more in diameter should be installed in the direction of the prevailing wind. This kill line should terminate at a suitable location to allow setting up pump trucks, mud tanks, and bulk barite tanks.

5.3 The closing unit should be located a safe distance from the wellbore and positioned for maximum utilization based on the prevailing wind direction. Auxiliary closing unit controls should be provided so they can be activated if the primary controls are not accessible. Auxiliary power source(s) for the closing unit pumps should be provided in case normal rig power and/or air are lost.

5.4 Refer to the latest edition of *API Bulletin D13** (currently being revised) for recommendations covering installation and use of the choke manifold, kill line, remote kill line, kelly cock, lower kelly valve, safety valves, and inside blowout preventer for hydrogen sulfide service.

API Bulletin D13: Installation and Use of Blowout-Preventer Stacks and Accessory Equipment, First Edition, is available from API Division of Production, 300 Corrigan Tower Bldg., Dallas, Texas 75201.

SECTION 6
SPECIAL EQUIPMENT

FLARE LINES

6.1 A degasser should be installed for separating gas from the drilling fluid between the first and second mud tanks. Flare lines should be installed from the degasser, choke manifold, and mud/gas separator to the burn pits. Flare lines should be of such diameter to allow easy, nonrestricted flow of gas containing hydrogen sulfide. Flare lines should be as long as practical (150 ft. minimum) with one flare line installed parallel to and the other flare line installed perpendicular to the prevailing wind direction. These lines should be targeted with running tees and securely stacked. Upon installation, flare lines should be tested with air, natural gas, or butane to assure proper operation.

BURN PIT AND FLARE IGNITION

6.2 A suitable method should be provided for igniting gas containing hydrogen sulfide at the burn pit or flare. This can be accomplished through use of either an automatic ignition system including a source of pilot gas or by installing the system in such a manner to allow gas ignition through use of flare guns, roman candles, etc. A combustible gas indicator should be provided for identifying the presence of combustible gas mixtures.

SECTION 7
HYDROGEN SULFIDE DETECTION

7.1 An automatic hydrogen sulfide monitor should be installed with a combination visual and audible alarm system located where it can be seen and/or heard throughout the drilling location. This system should have the capability of being activated from several points. Additional hydrogen sulfide monitors may be desirable.

7.2 The automatic hydrogen sulfide monitor should have a probe at the shale shaker and a probe should be positioned on the bell nipple. The automatic monitor should be set to trigger the drilling location visual/audible alarms when the hydrogen sulfide concentration in the atmosphere reaches 20 ppm.

7.3 In addition to the automatic hydrogen sulfide detection equipment, several hand-operated, bellows-type hydrogen sulfide detectors should be available with a supply of detector tubes.

7.4 A sulfur dioxide detector should be available for checking the sulfur dioxide level in the flare area when gas containing hydrogen sulfide is being burned.

SECTION 8
BREATHING EQUIPMENT

8.1 Masks which are designed to merely neutralize toxic gas do not provide the necessary protection and *should never be used in drilling operations when a hydrogen sulfide environment may be encountered.*

8.2 Self-contained breathing equipment is recommended for use in drilling operations involving a hydrogen sulfide environment. Two basic types of self-contained breathing apparatus are available and widely used in industry drilling operations.

a. Pressure-demand, fresh-air breathing equipment provides protection in any atmospheric concentration of hydrogen sulfide. This equipment has an alarm that signals when the breathing air supply is getting low, and can be serviced with a reserve air bottle.

b. Chemical units are available which convert exhaled breath into oxygen. These units are relatively light and can be used with a minimum of restriction to the wearer. An alarm system is incorporated which signals when the chemical supply is getting low, and replaceable chemical canisters are available for servicing the units.

8.3 Combination pressure-demand, air-line breathing equipment, with auxiliary self-contained air supply for emergency egress, is acceptable for use in drilling operations involving a hydrogen sulfide environment.

8.4 Masks should be stored in the location protection centers (sheds or trailers) and in other storage facilities located strategically around the operation, so that no person in normal work routine is more than "one breath away" from a mask. Appropriate racks should be available in the protection centers or other storage facilities for hanging masks. Every person working in the area (including geologist, mud engineer, service personnel, etc.) should be required to wear air breathing equipment during critical or emergency periods.

8.5 During well killing or other rig operation(s) requiring certain personnel to remain in a toxic environment, a back-up air manifold pressure-demand, fresh-air breathing system may be employed with connection points at the necessary locations.

8.6 Resuscitators with spare oxygen bottle should be provided at each location center or trailer.

SECTION 9

PLANS

9.1 All zones known to contain or suspected of containing hydrogen sulfide should be noted on the well prognosis and/or work plan.

9.2 Hydrogen sulfide is highly corrosive to steel; and, at high stress levels extreme metal embrittlement may occur in a very short time. All tubular goods, wellhead equipment, and other drilling related equipment which may be exposed to a hydrogen sulfide environment during the course of operations should be selected considering metallurgical properties which will reduce the chance of failure from hydrogen sulfide embrittlement.

9.3 To minimize intrusion of hydrogen sulfide bearing gas into the wellbore, drilling fluid density (weight) should be controlled at a level to prevent gas intrusion so that the only hydrogen sulfide entering the borehole will be from the drilled cuttings. *Caution:* Excessive drilling fluid density can result in loss of circulation.

9.4 Well planning should include consideration of use of a hydrogen sulfide scavenger in the drilling fluid system to reduce the reaction of the hydrogen sulfide on the drill string, pump fluid ends, chokes, and piping. Scavengers also reduce the amount of hydrogen sulfide reaching the surface. Hydrogen sulfide scavengers may be added as required to maintain a concentration in the drilling fluid sufficient to react with all hydrogen sulfide entering the drilling fluid.

9.5 The pH of the drilling fluid should be maintained above 9.5 at all times. In some cases, this may require a pH of approximately 11.5 to prevent a reduction in pH below 9.5 while round tripping the drill string.

9.6 Plans for drill stem testing operations should include consideration of the aforementioned points as well as information presented in *API RP 7G**, Section 8. Adherence to these considerations will severely limit conventional drill stem testing of deep, high pressure zones containing hydrogen sulfide.

9.7 If the overall well prognosis and/or work plan will permit, use of an oil base drilling fluids system will reduce the risk of metal embrittlement during drilling operations.

CONTINGENCY

9.8 A listing of emergency telephone numbers and radio contact procedure instructions should be prepared and maintained, considering the need to contact all or any portion of the following:

a. ambulances,
b. hospitals,
c. doctors,
d. helicopter service,
e. veterinarians,
f. state highway patrol,
g. county (parish) sheriff,
h. city police (if near a city or town),
i. state civil defense agency,
j. state national guard,
k. state air and water conservation agency.

These telephone numbers and methods for proper contact and/or notification to obtain immediate help or assistance should be prominently displayed at strategic points on the drilling location. It may prove desirable to contact some of the aforementioned services or agencies and explain the detailed circumstances under which their assistance may be needed and why a quick response would be necessary. Trial runs by ambulance services and/or helicopter services may be desirable, with instructions requiring attendants to be familiar with proper first-aid treatment for personnel who have been exposed to hydrogen sulfide.

9.9 A clear plastic container with a listing of current emergency telephone numbers and a map of the local area with all residential areas clearly marked should be located at both drilling location headquarters (operating company and drilling contractor) and in each location protection center or trailer.

9.10 Detailed operating conditions should be defined and posted for all personnel. Emergency procedures and duties should be clearly defined, including responsibilities of all applicable supervisory personnel.

9.11 Detailed step-by-step remedial procedures should be developed and posted to cover two emergency occasions:

a. when a well control problem occurs while making a trip.
b. when a well control problem occurs while drilling.

9.12 Established practices for installation of, testing, and maintaining blowout preventers should be followed. Regular scheduled and unscheduled drilling crew well control drills should be held.

9.13 If gas cutting of drilling fluid is encountered, blowout preventers should be closed while maintaining drilling fluid circulation through the choke lines to the mud-gas separator. The mud-gas separator should be connected into the flare line system. Normally, after circulating for a few hours the gas will decrease so the blowout preventers can be opened and normal drilling operations resumed without use of the choke system. The degasser should be used until the drilling fluid is free of entrained gas.

9.14 Personnel should put on applicable protective equipment when the hydrogen sulfide concentration in the atmosphere reaches or exceeds 20 ppm. After circulating out all gas cut returns, the shale shaker area should be periodically checked with hydrogen

*API RP 7G: *API Recommended Practice for Drill Stem Design and Operating Limits*, Fifth Edition, April 1974, is available from API Division of Production, 300 Corrigan Tower Bldg., Dallas, Texas 75201.

sulfide detection equipment until the concentration of hydrogen sulfide in the atmosphere drops below 20 ppm. Breathing equipment may then be removed until the hydrogen sulfide concentration again rises to the 20 ppm concentration level.

9.15 Nonessential personnel should be prohibited from remaining in or entering contaminated areas where the hydrogen sulfide concentration in the atmosphere exceeds 20 ppm. Exposure to hydrogen sulfide contamination should be reduced by shutting down air conditioning, heating, or ventilation systems which service enclosures for personnel.

9.16 "Gas discipline" rules should be adhered to. When the "masks on" requirement exists, *there are no exceptions.*

9.17 When coming out of the hole with a core barrel under suspected hydrogen sulfide conditions, the drilling crew should wear protective equipment while pulling the last twenty stands or at any time hydrogen sulfide reaches the surface. "Masks on" should be continued while opening the core barrel and examining the core.

9.18 Ignition of the well should be a last resort when human life and property are endangered and there is no hope of controlling the well blowout. If the well is ignited, the *burning hydrogen sulfide will produce sulfur dioxide which is also highly toxic.*

9.19 For functional and sanitary reasons, masks should be washed and sterilized in accordance with manufacturers' recommendations.

9.20 One wind velocity and wind direction weather station should be installed.

9.21 Approved wall type first aid kits with standard contents fill should be provided at each of the protection centers or trailers with a spare fill. Kit contents should be periodically inventoried and missing items replaced.

9.22 A minimum of five 30-pound dry chemical fire extinguishers should be strategically located around the drilling location.

9.23 Two rolls (500-foot total length) of 400-pound test, soft, fire-resistant rope should be provided for use as safety lines.

9.24 A rigid, body-fitting type litter should be provided in a location readily accessible to the work area.

9.25 A slide or other means for quick and safe escape of rig personnel from the rig floor to the ground or surface of the water should be provided.

SECTION 10

EVACUATION

10.1 The area within a two-mile radius of the well location should be checked out using a contour map. Due to high pressure dispersion, except on a dead calm day with a tremendous release of heavily concentrated vapors, the probability of lethal concentration of hydrogen sulfide beyond a one-mile radius is unlikely. Prevailing wind direction should be noted on the contour map. A thorough physical reconnaissance of the area should be made and the map noted to show the locations of houses, schools, barns, pens, roads, animals, and anything else that might cause people to be present who might need to be warned and/or evacuated in a crisis situation.

10.2 All houses shown on the contour map should be assigned a number and a listing compiled of the names of all residents of each house. An emergency reference record should be prepared containing the name(s) of persons residing in the area, telephone number contacts, and the map house number in which they reside. The possibility of alerting in advance all persons within the danger zone should be considered prior to entering the potential hydrogen sulfide bearing zone.

10.3 The contour map should be constructed to show one-half mile radius, one-mile radius, and two-mile radius from the drilling well location. A transparent sheet of plastic can be used to make an overlay showing wind direction and a 45-degree fallout zone that can be rotated on the map to fit existing wind direction. In an emergency, this procedure can be used to select the high priority areas and individuals to be warned and/or evacuated and to organize the warning and evacuation programs.

SECTION 11

TRAINING

11.1 Every person who will be at the location in any capacity should be familiar with requirements of the emergency procedures and should participate in the training program. This includes operating company personnel, rig personnel, and service company personnel. Personnel training should start in regular safety meetings as soon as possible after the drilling routine is established and should be appropriately intensified as the operation progresses.

11.2 Minimum personnel training should provide coverage of the following points or programs:

a. Detailed explanation of the seriousness of encountering hydrogen sulfide in drilling operations.

b. Explanation of rig layout details, prevailing winds, importance of adequate ventilation, use of mechanical blowers (fans), utilization of windsock and wind streamers, personnel movement in an upwind direction, and evacuation routes.

c. Personnel drills with breathing equipment. These drills should be initiated by actuating the hydrogen sulfide alarm. All personnel should proceed to the designated briefing area in accordance with the emergency procedures, don breathing equipment, and await instructions. They should then perform a short period of rig work routine in the breathing equipment.

d. Use, care, and servicing of:

1) Protective breathing equipment (self-contained breathing apparatus, emergency escape air bottles, hose line, etc.). Respirators should be stored in a convenient, clean, and sanitary location and a record kept of inspection dates and findings on all breathing equipment maintained for emergency

use. Respirators not routinely used but that are kept ready for emergency use should be inspected after each use or at least once a month, whichever comes sooner, to assure they are in satisfactory working condition.

2) Portable hydrogen sulfide detection instruments.
3) Sulfur dioxide detection instrument(s).
4) Combustible gas indicator.
5) Resuscitation equipment.
6) Portable fire extinguishers.
7) Emergency alarm system.

e. Mouth-to-mouth resuscitation and the following first aid procedure points should a person be overcome by hydrogen sulfide:
1) Wear breathing equipment if rescuing a person in an area suspected to be contaminated by hydrogen sulfide.
2) Person(s) overcome by hydrogen sulfide should be immediately moved to a spot where uncontaminated air is available. If the person is not breathing, mouth-to-mouth resuscitation should be administered as soon as possible.
3) At the first opportunity, replace mouth-to-mouth resuscitation efforts with the resuscitator equipment.
4) Continue to administer oxygen when the person begins breathing.
5) Treat patient for shock.
6) Contact ambulance and doctor.

f. Understanding that appropriate tests should be made before persons enter areas suspected of being contaminated by hydrogen sulfide. These tests should be made after personnel have donned self-contained breathing equipment.

g. Develop personnel practice of watching out for each other when emergency conditions exist. Where possible, work should be performed in pairs. When a hydrogen sulfide emergency exists, personnel should use the "buddy system" to prevent anyone from entering a contaminated area alone.

h. Explanation to personnel that they should never enter an enclosed place where hydrogen sulfide may have accumulated without wearing protective breathing equipment. If the worker is over an arm's length away, a life belt and life line should be secured to him and the other end held by a responsible person stationed in a clear area. After being in an enclosed area containing hydrogen sulfide, persons should not remove breathing equipment until tests indicate that the air is safe to breathe.

i. Explanation of the effects of hydrogen sulfide on metal. Hydrogen sulfide dissolves in water to form a weak acid that can cause some pitting, particularly in the presence of oxygen and/or carbon dioxide. However, the most significant action of hydrogen sulfide is its contribution to a form of hydrogen embrittlement known as sulfide stress cracking. Sulfide stress cracking is a result of metals being subjected to high stress levels in a corrosive environment where hydrogen sulfide is present. The metal will often fail catastrophically in a brittle manner. Sulfide stress cracking of steel is dependent upon and determined by:
1) Strength (hardness) of the steel—the higher the strength the greater the susceptibility to sulfide stress cracking. Steels having yield strengths up to 95,000 psi and hardnesses up to R_c 22 are generally resistant to sulfide stress cracking. These limitations can be extended slightly higher for properly quenched and tempered materials.
2) Total member stress (load)—the higher the stress level (load) the greater the susceptibility to sulfide stress cracking.
3) Corrosive environment—corrosive reactions, acids, bacterial action, thermal degradation, or low pH fluid environment.

j. In the event of sudden gas release with no advance warning, personnel should be instructed to take the following general actions:
1) Hold breath (do not breathe).
2) Put on protective breathing equipment.
3) Help any person(s) in distress.
4) Proceed to the designated briefing area and secure instructions from supervisor.
5) Do not panic.

SECTION 12

CONCLUSIONS

12.1 Information outlined in this recommended practice is for guidance toward a prudent, safe operation. The illustrations (Fig. 1 and Fig. 2) represent suggested equipment and typical layouts and are not intended to limit any operating company or drilling contractor to these particular installations.

12.2 To accomplish the intended purpose of this publication, information presented herein should be rigidly adhered to by all persons at the location.

Form OGCC-1 be

STATE OF UTAH

OIL & GAS CONSERVATION COMMISSION

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

2. NAME OF OPERATOR: Chevron U.S.A. Inc.

3. ADDRESS OF OPERATOR: P. O. Box 599, Denver, CO 80201

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 533' FSL & 755' FEL SESE

5. LEASE DESIGNATION AND SERIAL NO.: Fee

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Chevron

9. WELL NO.: 1-17B

10. FIELD AND POOL, OR WILDCAT: Thomas Canyon-Subthrust Cretaceous

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 17, T7N, R8E

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): GR 6921

12. COUNTY OR PARISH: Rich

13. STATE: Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other)			☐
(Other) H_2S Contingency Plan			X	(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

H_2S Contingency Plan Attached.

APPROVED BY THE STATE OF UTAH DIVISION OF OIL, GAS, AND MINING
DATE: 5-6-81
BY: M. J. Minder

RECEIVED
APR 27 1981
DIVISION OF OIL, GAS & MINING

LLK:tw

18. I hereby certify that the foregoing is true and correct

SIGNED Arlene F. Bush TITLE Engineering Assistant DATE April 21, 1981

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

** FILE NOTATIONS **

DATE: May 11, 1981

OPERATOR: Chevron U.S.A. Inc.

WELL NO: Deseret Skull 1-17B

Location: Sec. 17 T. 7N R. 8E County: Rich

File Prepared: ☑ Entered on N.I.D: ☐

Card Indexed: ☑ Completion Sheet: ☑

API Number 43-033-30032

CHECKED BY:

Petroleum Engineer: _____

Director: OK OBF

Administrative Aide: OK as per C-3 spacing ok on bndrys., ok on any other oil & gas wells.

APPROVAL LETTER:

Bond Required: ☑ K-Blanket filed Survey Plat Required: ☐

Order No. _____ O.K. Rule C-3 ☐

Rule C-3(c), Topographic Exception - within a 660' radius of company owns or controls acreage proposed site ☐

Lease Designation Fee Plotted on Map ☐

Approval Letter Written ☑

Hot Line ☑ P.I. ☑

May 19, 1981

Chevron USA Inc.
P. O. Box 599
Denver, Colorado 80201

Re: Well No. Chevron Deseret Skull 1-17B
Sec. 17, T. 7N, R. 8E, SE SE
Rich County, Utah

Insofar as this office is concerned, approval to drill the above referred to gas well is hereby granted in accordance with Rule C-3, General Rules and Regulations and Rules of Practice and Procedure.

Should you determine that it will be necessary to plug and abandon this well, you are hereby requested to immediately notify the following:

MICHAEL T. MINDER - Petroleum Engineer
Office: 533-5771
Home: 876-3001

Enclosed please find Form OGC-8-X, which is to be completed whether or not water sands (acquifers) are encountered during drilling. Your cooperation in completing this form will be appreciated.

Further, it is requested that this Division be notified within 24 hours after drilling operations commence, and that the drilling contractor and rig number be identified.

The API number assigned to this well is 43-033-30032.

Sincerely,

DIVISION OF OIL, GAS, AND MINING

Cleon B. Feight

Cleon B. Feight
Director

CBF/ko
cc:

LA 2

Chevron U.S.A. Inc.
700 South Colorado Blvd., P. O. Box 599, Denver, CO 80201

October 14, 1981

G. H. Thomas
Area Superintendent

Thomas Canyon
Sections 17, 20, 29
T7N, R8E
Rich County, Utah

State of Utah
Department of Natural Resources
Division of Oil & Gas Conservation
1588 West North Temple
Salt Lake City, Utah 84116

Gentlemen:

Please refer to Application for Permit to Drill wells in the above referenced sections in Rich County, Utah. State approval to drill these three wells was received May 15, 1981.

By copy of this letter we are advising you that Chevron U.S.A. Inc. has no plans for drilling these wells at this time.

If you need additional information please call Louis Kirkpatrick at (303) 759-7522.

Very truly yours,

G. H. Thomas

LLK:ls